

M-RAD Team Meeting Agenda

Date: Tuesday September 13, 2016

Start Time: 4:30 pm

Location: Renfrew Hall Classroom

Attendance: Kyle, Blake, Fawaz, Selso, Dr. Dan, Dr. Beyerlien

Late/Absent:

Meeting Objective:

- Establish Project Goals
 - 1.To fully understand the current state of the project
 - 2.Identify Hardware, possibly get a turret for testing and product development
- Brainstorm
- Project Learning
 1. Torque Sensors, Sensors for measuring angle
 2. Backlash, backlash fixture
 3. Fixtures for motor, turret, etc.
 4. Company Standards
 5. Data Acquisition Platform
 6. Meteorology of Threads
 7. Burnishing Process
 8. Material Treatment
 9. Laser Methods for Backlash

Other Information & Business:

- Have questions prepared to ask at the client interview and company tour
- Gmail Information

Username: mradproject@gmail.com

Password: nightforce4

Tasks:

Blake: Research Sensors

Kyler: Research Burnishing Process

Selso: Research Methods for measuring backlash

Everyone bring 10 questions for the client interview to compile them

Next Meeting:

Date: **Thursday September 15, 2016**

Start Time: **3:30 pm**

Location: **Senior Design Suite**

End Time: **5:00 pm**

M-RAD Team Meeting Agenda

Date: Thursday September 15, 2016

Start Time: 3:50

Location: Library

Attendance: Kyle, Fawaz, Blake, Selso

Late/Absent:

Meeting Objective:

- Present findings from research
 - Linear displacement for Backlash is most commonly used
 - For burnishing a fluid is used to keep things cool
 - Motor with encoder is better than a stepper motor because steppers have less torque and are inaccurate
- Compile interview questions
 1. What do you value the most about the current burnishing process?
 2. What are the different models that are being burnished?
 3. What is the budget for this project?
 4. What is the current method for measuring the backlash and torque?
 5. How many cycles must this machine run in its lifetime?
 6. Apart from backlash and torque what other information would be useful to output for this operation?
 7. What about the current process need the most improvement?
 8. What is the goal for the output on this machine as far as parts completed per day/ shift/ operation period?
 9. Would it be ideal to produce a design that would allow for multiple burnishing machines to be created and used for the burnishing process?
 10. What is the size restriction for the overall design of this machine?
 11. What are the thread standards?
 12. What are the relative speed on the burnishing process?
 13. How many parts, what percentage of parts are ruined and how are they ruined with the current burnishing process, success rate?
 14. Are the tolerances for the same for different turrets?
 15. Can we modify your tools and how many tools do you have?
- Share new Ideas
 - Basic Idea CNC Drill with a torque
 - Idea for measuring backlash from the bottom of the Turret
- Discusses Project Learning
 - Turrets are relatively cheap to make

- Lubricant is used in burnishing process
- Specs for torques, measure
- Create rough timeline to meet project goals

9/16 1st team Meeting & Minutes Circulated

9/29 Client interview with instructor completed, Transcript of Interview, Target Specs sent to client

10/4 Logbook review & Portfolio (Due to lead Instructor)

10/11 Snapshot Day 1

11/4 Draft a Wiki page Due, Elevator Pitch Competition

11/8 Logbook Review

11/18 Design Review

12/2 Snapshot Day 2

12/9 Project Portfolio, Wikipage, Logbook review

Other Information & Business:

- Have questions prepared to ask at the client interview and company tour
- Gmail Information

Username: mradproject@gmail.com

Password: nightforce4

Tasks:

Blake: Torque Sensors-Static high resolution low torque Static

Kyle: Research Drill Press Designs

Selso: Motors-Encoder, AC/ DC, H-bridge, Power, Types, Converter

Fawaz: Research belts and pulleys along with Drill Press Designs

Next Meeting:

Date: Tuesdays September 20, 2016

Start Time: After 424 Class

Location: Renfrew Hall Classroom

End Time: 5:50 pm

M-RAD Team Meeting Agenda

Date: Tuesday September 20, 2016

Start Time: 4:28 PM

Location: Renfrew Hall Classroom

Attendance: Kyle, Blake, Fawaz, Selso, Dr. Dan

Late/Absent: Dr. Beyerlien

Meeting Objective:

- *Status Update*
 - *Brainstorming Ideas about Critical and Necessary components*
 - *Setting up Client Interview*
 - *Basic Drill Press Designs*

- *Project Learning*

-Components

Torque Sensor -design our own for customization and price, Current and Voltage Measurements to calculate torque, Linear Potentiometer & Spring, Torque Wrenches

Motor- Stepper Motor or Regular Motor, Gear Reduction Motors

Splined Shaft -Odom recommended a keyed Shaft and use a bushing, Detent to hold Shaft in place

Drill Press- Linear Bearings, Invert the Design, Might Make backlash testing Easier

Belts & Pulleys: Inchdrive Components

Quantifying their Current Methods

- *Compile interview Questions*
 - *Add Questions to Google Drive*
- *Begin inserting things into Portfolio*
 - *Selso will bring Initial Portfolio and bring to next meeting*
- *Client Interview*
 - *Thursday September 29, 2016*
 - *Plan to be at the Site at 2:30 pm*

Other Information & Business:

Tasks:

Blake: **Confirming Meeting Time with PI**

Kyle: **Interview Questions**

Selso: **Initial Project Portfolio**

Fawaz: **Interview Questions**

Next Meeting:

Date: Thursday September 22, 2016

Start Time: 3:30 pm

Location: Library 1st Floor Room 31

End Time: 5:06 pm

M-RAD Team Meeting Agenda

Date: Thursday October 6, 2016

Start Time: 4:03 pm

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso

Late/Absent:

Meeting Objective:

- *Status Update*
 - *Client interview complete*
 - *Project goal is clear and defined*
 - *Logbooks turned in to Dr. Dan*
- *Portfolio*
 - *Insert items as we complete them*
 - *Tabs and Items that are complete are inserted*
- *Sketch Basic Designs*
 - *Basic design is the idea of a drill press*
 - *Most difficult part of design is incorporating the torque and backlash measurement into the automation*
- *Project Learning*
 - *Torque sensors to test torques on turrets*
 - *Backlash testing with a Linear Potentiometer*
- *Create an official Calendar for project*
 - *Create a calendar that clearly outlines the project for the remainder of the semester*
- *Have a set meeting time*
 - *Meetings will be on Mondays at 12:30 pm in the Senior Design Suite*
 - *Secondary Meetings will be held Thursday at 3:30 pm in the Senior Design Suite*
- *Contact PI About Turrets*
 - *Request 4 burnished Turrets*
 - *2-SA266*
 - *2-SA289*
- *Compile everything for Snapshot Day 1 Tuesday October 11*
 - *Solid Models of Our Design Ideas*
 - *Printout of Team Name, Members, Client, Descriptive Project Title*
 - *Problem Statement*
 - *Design Goals/Deliverables*
 - *Table of Specifications*
 - *Documentation and Project learning*

- *Semester Plan/Schedule*

Other Information & Business:

- Priorities include torque and backlash measurements
- Holding the turrets rigid during operation
- Get drawings for tools and actual tools if possible for the turrets we are getting

Tasks:

Blake: Contact PI about getting turrets, tools, and part drawings

Kyle: By Monday create a calendar for the rest of the semester

Selso: Compile Items for Snapshot Day

Fawaz: Create a 3D Model of a base design to hold turrets and measure torque and backlash

Next Meeting:

Date: Monday October 10, 2016

Start Time: 12:30 pm

Location: Gauss Johnson Senior Design Suite

End Time: 5:14 pm

M-RAD Team Meeting Agenda

Date: Thursday October 10, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso, Dr. Dan

Late/Absent:

Meeting Objective:

- *Status Update*
- *Portfolio*
- *Present Base Designs*
- *Project Learning*
 - *Torque sensors to test torques on turrets*
 - *Backlash testing with a Linear Potentiometer*
- *Present official Calendar for project and make changes*
- *Confirm that PI was contacted about Turrets*
 - *Requested 4 burnished Turrets*
 - *Kyle Contact PI About Turrets*
 - *2-SA266*
 - *2-SA289*
 - *Blake Contact PI About Tool Drawings*
- *Compile everything for Snapshot Day 1 Tuesday October 11*
 - *Solid Models of Our Design Ideas*
 - *Printout of Team Name, Members, Client, Descriptive Project Title*
 - *Problem Statement*
 - *Design Goals/Deliverables*
 - *Table of Specifications*
 - *Documentation and Project learning*
 - *Semester Plan/Schedule*
- *Capstone Mentor Is Jacob Giles(Jake)*
Email: gill5051@vandals.uidaho.edu

Other Information & Business:

- *Drop off Logbooks Wednesday Morning*
- *More Project Learning*
 - *Solenoids*
 - *Dial Indicators with Electrical Readouts*

- Piezo Distance Sensors
- V-Block
 - Rubber
 - Other Synthetic Material
 - Low Hardness
 - Low Wear
 - Low Coefficient of Friction
 - Loading Using A pneumatic Method (Cylinders)
- Design Phases

Tasks:

Blake: Tool Drawings from PI

Kyle: Contact PI about Turrets

Selso: Compile Info for Snap Shot

Fawaz: Compile Snapshot Info

Next Meeting:

Date: Thursday October 13, 2016

Start Time: 3:30 pm

Location: Gauss Johnson Senior Design Suite

End Time: 1:21 pm

M-RAD Team Meeting Agenda

Date: Thursday October 13, 2016

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso

Late/Absent:

Meeting Objective:

- More Project Learning
 - Solenoids
 - Dial Indicators with Electrical Readouts
 - Piezo Distance Sensors
- **Baluff Proximity Sensor**
 - **Contact Brain Stiffness Group About Sensor Presentation**
- *Present official Calendar for project and make changes*
 - *Calendar on Drive*
- *Confirm that PI was contacted about Turrets*
 - *Requested 4 burnished Turrets*
 - *Kyle Contact PI About Turrets*
 - 2-SA266
 - 2-SA289
 - *We have the turrets*
- *Blake Contact PI About Tool Drawings*
- Design Phases
 - Base, and
- V-Block
 - **Prototype on Drive Make Edits to it**
 - Rubber
 - Other Synthetic Material
 - Low Hardness
 - Low Wear
 - Low Coefficient of Friction
 - Loading Using A pneumatic Method (Cylinders)

Other Information & Business:

Tasks:

Blake: Email Base Block to Each of Us

Kyle: Contact PI about unburnished,

Selso: Contact Brain Stiffness Group about Sensor Presentation

Fawaz: Create a folder on the Shared Drive, Contact Dr. Dan

Next Meeting:

Date: Monday October 17, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

End Time:

M-RAD Team Meeting Agenda

Date: Thursday October 20, 2016

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso, Dr. Dan

Late/Absent:

Meeting Objective:

- Project Learning
 - Clamping Force of the V-Blocks
 - Acetone Vapor 3D Printing with ABS
 - Pneumatic Clamp, Buy one from McMaster-Carr
 - Stepper Motors
- Design Phases

Base:

1. Hold different models of turrets
2. Incorporate Backlash Measurement
3. Measure Torque

Spindle Assembly:

1. Shaft
2. Bushings
3. Pulley
4. Motor

Frame:

1. Hold Spindle Assembly and connect to base
- - Wiki Page

Other Information & Business:

- Long-term Sustainability-Purchase parts if possible
- Start Prototyping as soon as possible
- Incorporate spring to retract V-Blocks

Questions for Wolbrecht: Buy or Build torque Sensor? Backlash Sensor?

Pros and Cons to Building:

Pros: Built to Specs, More affordable

Cons: Not easy to replicate, May not be reliable, Takes time to machine, build and calibrate, repairs

Tasks:

Blake: Conduct experiment and Estimate torque on Burnished turrets

Kyle: Conduct experiment and Estimate torque on Burnished turrets

Selso: Invite Wolbrecht to our next meeting

Fawaz: Wiki Page

Next Meeting:

Date: 10/27/2016

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:45 pm

M-RAD Team Meeting Agenda

Date: Thursday October 27, 2016

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance:

Late/Absent:

Meeting Objective:

- Project Learning
- Backlash Sensors
- Torque Sensors
- Dove Tail vs T-Slots
- Air Fittings
- Wiki Page Progress, Draft due November 4 to lead Instructor
- Draft in Progress
- Send Pictures, Profile Info, Designs to Fawaz
 - Profile
 - Major:
 - Hometown:
 - Graduation:
 - Email:
 - Responsibilities:
 - Hobbies:
 - Plan after Graduation:
- Logbook & Portfolio Due November 8 to Lead Instructor
- Update Portfolio
- Keep Log Books Up to date
- Design Review(w/client & Lead Instructor), Shoot for November 10,
- Ask PI About Turret Drawings, Design Review Date and People Attending
- Create A prototype
- Presentation: Problem Statements, Design Phases, Current Design
- Prototype Something For Design Review
- Prototype Turret Holding Blocks

Other Information & Business:

Shared Drive Folder

Shared > Engineering > SeniorDesign > M-RAD

Tasks:

Blake: Email PI

Kyle: Email Dr. Wolbrecht about Attending Our Meeting

Selso: Finish V-block Models to Start Machining Them

Fawaz: Work on Wiki Page

Next Meeting:

Date: 10/30/2016

Start Time: 12:30 pm

Location: Senior Design Suite

Meeting Ended: 4:45 pm

M-RAD Team Meeting Agenda

Date: Monday October 31, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

Attendance: *Blake, Kyle, Fawaz, Selso, Dr. Dan*

Late/Absent:

Meeting Objective:

- Project Learning
 - Backlash Sensors
 - Torque Sensors
 - Dove Tail Vs T-Slots
 - Air Fittings
- Wiki Page Progress, Draft due November 4 to lead Instructor
 - Submit draft to Dan
 - Review Draft
- Logbook & Portfolio Due November 8 to Lead Instructor
 - Review Logbooks
 - Update Logbooks Keep them up to date
- Design Review (w/client & Lead Instructor), Shoot for November 10,
 - Problem Definition
 - Deliverables
 - Design Concepts
 - Components
 - Bill of Materials
 - Design Phases
 - Presentation: Problem Statements, Design Phases, Current Design
- Ask PI About Turret Drawings, Design Review Date and People Attending
- Create A prototype
 - Create a Base with Torque and Backlash Sensor
 - Redesign Clamping Blocks
 - Redesign other Essential Components
- Prototype for Design Review
- Prototype Turret Holding Blocks

Other Information & Business:

Use the shared drive folder for all the project work

Tasks:

Blake: **Work on Torque Sensor**

Kyle: **Presentation**

Selso: **CAD Work On Prototype**

Fawaz: **Wiki Page**

Next Meeting:

Date: 11/07/2016

Start Time: 12:30 pm

Location: Senior Design Suite

Meeting Ended: 1:17 pm

M-RAD Team Meeting Agenda

Date: Monday November 07, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

Attendance: *Blake, Kyle, Fawaz, Selso, Dr. Dan*

Late/Absent:

Meeting Objective:

- Project Learning
Dove Tail Vs T-Slots
- Wiki Page Progress, Draft due November 4 to lead Instructor
Continue to Improve Wiki Page
- Logbook & Portfolio Due November 8 to Lead Instructor
Turn Logbooks into Dr. Dan after Design Review
- Design Review (w/client & Lead Instructor), Shoot for November 10,
Problem Definition, Deliverables, Design Concepts, Components, Bill of Materials, Design Phases, Presentation: Problem Statements, Design Phases, Current Design, Design Review is on November 10, 2016 @ 5pm in the ME Conference Room
- Work on Prototype
*Finalize Base with Torque and Backlash Sensor for the backlash sensor
3-D Print Clamps & Torque Sensor*

Other Information & Business:

Tasks:

Blake: *3-D Print, Model Sensors*

Kyle: *Presentation*

Selso: *Redesign Parts on Prototype*

Fawaz: *Update Wiki Page*

Next Meeting:

Date: *11/10/2016*

Start Time: *5:00 pm*

Location: *ME Conference Room*

Meeting Ended: *1:03 pm*

M-RAD Team Meeting Agenda

Date: Monday November 13, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

Attendance: *Blake, Kyle, Fawaz, Selso, Dr. Dan*

Late/Absent:

Meeting Objective:

- Electronic Schematic Diagram

Create a useful diagram and begin to develop each component of it

- Notes to Share about Design Review

Handle on spindle

Manual mode for operator feel

Purchase parts

- Define Goals for rest of semester

Create a base with all sensors, work effectively and aggressively towards doing so

- Deliverables for Snap Shot on December 2

Operating Jaw Block

Calibrated Sensors

Torque Sensor Assembly

- Team Member Citizenship - email electronic copy to your lead instructor, Due Friday November 18

Email to Dr. Dan by Friday

- Proof of Concepts

Arduino or Data acquisition using Matlab for sensors

Building Blocks on CNC then testing them

- Order Parts

Potentiometer

Air Clamp with fittings

Linear Solenoid

Keyed Shaft

Stepper Motor

Other Information & Business:

- Piezo Sensors, Drift and Control System
- Orientation of assembly can still change
- ¼ inch hex drives
- Reject turrets to test torque in jaws
- Electronic Pressure regulator
- Pressure gauge

Tasks:

Blake: Machine Torque Sensor

Kyle: Order Parts, send plan to everyone before ordering

Selso: Redesign clamps, Work on CNC Machining them

Fawaz: Work on Wiki page, develop proof of concept for torque sensor

Next Meeting:

Date: 11/17/2016

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 1:11 pm

M-RAD Team Meeting Agenda

Date: Monday November 13, 2016

Start Time: 12:30 pm

Location: Senior Design Suite

Attendance: *Blake, Kyle, Fawaz, Selso, Dr. Dan*

Late/Absent:

Meeting Objective:

- Electronic Schematic Diagram

Create a useful diagram and begin to develop each component of it

- Notes to Share about Design Review

Handle on spindle

Manual mode for operator feel

Purchase parts

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Create a base with all sensors, work effectively and aggressively towards doing so

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Operating Jaw Block

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Stepper Motor

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Tasks:

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Selso: Redesign clamps, Work on CNC Machining them

Fawaz: Work on Wiki page, develop proof of concept for torque sensor

Next Meeting:

Date: 11/17/2016

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 1:11 pm